

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

***Tuesday-February 01, 2005: PR-042, Blue Quench: File# = Data did not record!***

Permit ID: N/A Timestamp: **Qdplots = 04:16:32** Beam Permit Fail Timestamp: N/A

QPAControl / Timing Resolver: No Data Available

Quench Detector(s) Trip: No Data Available

5 Minute: Quench Delay File: No Data Available

Beam Loss Monitors (Rads/Hr): No Data Available

Main Magnet Power Status: Store Energy

QLI Recovery TAPE Start: **06:47:56** Link Recovered Time: **06:56:34** Estimated Down Time: **160** minutes

***Quench Analysis: Power Dip***  
**(Counter = Power Dip)**

***Tuesday-February 01, 2005: PR-042, Yellow Quench: File# = Data did not record!***

Permit ID: N/A Timestamp: **Qdplots = 04:16:32** Beam Permit Fail Timestamp: N/A

QPAControl / Timing Resolver: No Data Available

Quench Detector(s) Trip: No Data Available

5 Minute: Quench Delay File: No Data Available

Beam Loss Monitors (Rads/Hr): No Data Available

Main Magnet Power Status: Store Energy

**Technical Notes / Sequence of Events:** A major power dip had occurred around 4:15 A.M. (see details described below). At the time of this writing, I have no idea as to why Data was not stored to the Pet and Postmortem Pages. Qdplots did store data and the machine was running at Top Energy at the time of the Power Dip. *G. Heppner*

2005-Feb-01 08:44:23 Summary: <ul> Between the RHIC store from the previous shift and one started on this shift, physics ran for 4.12 hours. The second store was aborted due to a major power dip at 04:15, for which the cause is under investigation by LIPA and a BNL line crew. </p> The power dip occurred at the same time as a BMMPS trip on a station 1B overload fault, and a trip of the LIPA feed to the BMMPS transformer. Investigation and recovery is being coordinated between the MCR, J. Dowd, a line crew, and T. Gillard at LIPA. P. Ingrassia, M. Bannon, J. Sandberg, T. Nehring, C. Montag, F. Pilat, and J. Tuozzolo have been informed of the situation.

2005-Feb-01 04:15:00 Physics is off. A major power dip has occurred.

2005-Feb-01 04:17:00 MCR, CAS, and Fire/Rescue are responding to a fire alarm in the basement of 928.

2005-Feb-01 04:40:00 The 928 fire alarm is false and has been cleared. The Site Supervisor has relayed a message from Tom Gillard at LIPA, that the bank #7 has been de-energized due to a trip on transmission line 69-861. The BMMPS should not be restored until the state of switch equipment can be verified.

2005-Feb-01 06:18:00 a line crew is heading over to verify the status of switch 627 and 662, in addition to bank #7 and the OCB60-70. They did not find any indications of problems at switch 631 for the BMMPS.

2005-Feb-01 14:09:36 Summary: LIPA identified the source of the Booster 60 kV feed to a downed power line this morning. The end cap for one of the three phases broke off the ceramic body on the pole. Systems tripped by the resulting power dip were restored to operation this shift and the scheduled maintenance day began a day early while LIPA repaired the power line. As of the end of the shift the line is repaired and is about to be energized. The AGS ring requires a sweep. Most of the RHIC ring will need to be re-swept as well. L20 septum testing is underway in the AGS. The septum is barriered in the ring. Access Controls personnel are certifying the HEBT area. When they are completed the TTB crossover requires a sweep. Tandem would like to perform testing with the Booster beam stops open as soon as possible. 930dicom alarm for the 930 pump room server requires attention from H Ashby. The alarm has been acknowledged.

QLI Recovery TAPE Start: **06:59:37** Link Recovered Time: **07:07:05** Estimated Down Time: **170** minutes

***Quench Analysis: Power Dip***  
**(Counter = Power Dip)**

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**Emergency - Scheduled Maintenance 08:00 to 20:00**

**Tuesday-February 01, 2005: PR-043, Blue and Yellow Quench Files:**

**File# = 1107267447**      **Permit ID: Blue: 6-ps1**      **Timestamp: 09:17:24 +3393763**

**Cause:** yi7-qd2-ps placed into the off state.

**File# = 1107267481**      **Permit ID: Yellow: 6b-ps1**      **Timestamp: 09:18:29 +1326330**

**Cause:** Maintenance changed from February 2, 2005 to February 1, 2005.

**Main Magnet Power Status:** Park Currents.    **DX Heaters:** None fired.

**Technical Notes / Sequence of Events:** *Physics Log:* Due to the power dip that occurred earlier this morning, we expect to be down for about 8 hours from now. To minimize time lost, we have decided to re-schedule tomorrow's Maintenance Day for TODAY, starting immediately. This means there will be NO Maintenance Day tomorrow. A re-scheduling of the Beam Experiments is currently being discussed. I'll keep you informed. Christoph

Blue and Yellow Link brought down for RHIC Power Supply Maintenance. -G Heppner. [rhic] [ps]

**Feb-01-2005 20:11** RHIC ps Maintenance performed today:

1) Repaired shorted temperature sensor in yellow sector 10 string. 2) Replaced fan in yo8-rot3-2.3-qp. 3) Fixed MADDC read-backs for yi6-rot3-2.3. 4) New compensation installed for bi1-th7-ps, bo2-th4-ps and bo2-th6-ps for 10Hz beam oscillation canceling system (Carl S.) 5) Checked yo1-th14-ps because it had a problem clearing lead flow interlock once, now ok. 6) Replaced broken magnet triplet fans. 7) Checked ps-qp-qpaic connections for b6-dh0-ps. 8) Checked connections on the 3 channel isolation amplifier boards of bo10-qf8-ps, bi12-qf9-ps, bo2-qd1-ps, bi12-qf1-ps, and yi3-qf1-ps. 9) Replaced housekeeping p.s. of b2-q6-ps. 10) Checked timing resolver in alcove 3c, it is fine now. -Don Bruno [rhic] [ps]

**Blue Recovery TAPE Start: 19:00:41**

**Link Recovered Time: 19:09:47**

**Down Time for Blue: 592 minutes**

**Yellow Recovery TAPE Start: 17:04:07**

**Link Recovered Time: 17:12:45**

**Down Time for Yellow: 474 minutes**

**Quench Analysis: Scheduled Maintenance**

**(Counter = Maintenance)**

## ***RHIC Physics fy05 Run***

### ***Daily Quench Analysis for the month of February 2005***

#### **Wednesday-February 02, 2005: PR-044, Yellow Quench: File# = 1107335947**

Permit ID: 1b-ps1      Timestamp: 04:19:04 +3213761      Beam Permit Fail Timestamp: 04:19:04 +3213790

QPAControl / Timing Resolver: N/A

Quench Detector(s) Trip: 1b-qd1, Y1QFA2\_A1VT, Int. 5, Tq – 23, no auxiliary trips.

5 Minute: Quench Delay File: No indications, Systems Running, however???

Beam Loss Monitors (Rads/Hr): BLM indicate loss beam throughout several sectors but the highest levels are indicated here:

BLM: Sector1: g1-lm20 = 2004.44, g1-lm19 = 677.61, g1-lm18 = 4534.02, g1-lm17 = 4363.01, g1-lm16 = 4642.12

BLM: Sector4: g4-lm13 = 4917.37, g4-lm14 = 4718.45, g4-lm15 = 3148.89

BLM: Sector5: g5-lm13 = 4817.68, g5-lm11 = 4757.66, g5-lm8 = 4784.42 (Spin Magnet: g5-lm9.3, g5-lm9.2, g5-lm9.1)

BLM: Sector6: g6-lm14 = 4457.82, g6-lm12 = 2921.93, g6-lm8 = 2795.84 (Spin Magnet: g6-lm9.3, g6-lm9.2, g6-lm9.4)

BLM: Sector9: g9-lm21 = 4023.98

Main Magnet Power Status: Ramping from Injection to Store: YDMC = 911.02 amps, YQMC = 864.02 amps.

**Technical Notes / Sequence of Events:** QP02-R03B07-yi3-sxd-qp, qpaCtrl.3b-ps2.B1.8, Crowbar, cfe-3b-ps2

The quench at 4:19:07, this morning, was a beam induced quench for both blue and yellow. The qdRealQuench pet page did not show this as a real magnet quench because this page is not reliable for low current magnet quenches. Qdplots does show it as a real magnet quench. The analysis will soon follow at the time of the quench. -Don Bruno [rhic] [quench]

There was no indication of a power supply at fault prior to the quench. The Yellow Quench link trip was caused by the 1b-qd1-quench detector. The quench detector tripped because of a real magnet quench at Y1QFA2\_A1VT. The beam permit tripped after the quench link. There was one real magnet quench in the y01 Arc Quad. There was high beam loss at g1-lm20, g1-lm19, g1-lm18, g1-lm17 and g1-lm16. There are now 18 beam induced quenches for this run. G Heppner

QLI Recovery TAPE Start: 04:40:56      Link Recovered Time: 04:48:23      Estimated Down Time: 29 minutes

**Quench Analysis: Beam Induced Quench #018**

**(Counter = Beam Induced)**

#### **Wednesday-February 02, 2005: PR-044, Blue Quench: File# = 1107335947**

Permit ID: 5b-ps1      Timestamp: 04:19:04 +3486975      Beam Permit Fail Timestamp: 04:19:04 +3213774

QPAControl / Timing Resolver: N/A

Quench Detector(s) Trip: 5b-qd1, B4QFA6\_A7VT, Int. 20, Tq – 24, no auxiliary trips.

5 Minute: Quench Delay File: No indications, Systems Running, however???

Beam Loss Monitors (Rads/Hr): See above Data for Yellow Quench.

Main Magnet Power Status: Ramping from Injection to Store: BDMC = 914.69 amps, BQMC = 866.91 amps

DX Heaters: None fired.

**Technical Notes / Sequence of Events:**

The quench at 4:19:07, this morning, was a beam induced quench for both blue and yellow. The qdRealQuench pet page did not show this as a real magnet quench because this page is not reliable for low current magnet quenches. Qdplots does show it as a real magnet quench. The analysis will soon follow at the time of the quench. -Don Bruno [rhic] [quench]

There was no indication of a power supply at fault prior to the quench. The Blue Quench link trip was caused by the 5b-qd1-quench detector. The quench detector tripped because of a real magnet quench at B4QFA6\_A7VT. The beam permit tripped .273 seconds prior to the quench link. There was one real magnet quench in the b04 Arc Quad Region. There was high beam loss at g4-lm13, g4-lm14 and g4-lm15. There are now 18 beam induced quenches for this run. G Heppner

QLI Recovery TAPE Start: 04:33:23      Link Recovered Time: 04:40:45      Estimated Down Time: 22 minutes

**Quench Analysis: Beam Induced Quench #018**

**(Counter = Beam Induced)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

**Wednesday-February 02, 2005: PR-045, Blue Quench: File# = 1107338239**

Permit ID: 2b-ps1      Timestamp: 04:57:16 +3808545      Beam Permit Fail Timestamp: 04:57:16 +3808574

QPAControl / Timing Resolver: No faults indicated, b-QD first to trip.

Quench Detector(s) Trip: 2b-qd1, B1QFQ6\_4VT, Int. 1, Tq - 24, no auxiliary trips.

5 Minute: Quench Delay File: No indications, Systems Running.

Beam Loss Monitors (Rads/Hr): Minimal in this sector.

Main Magnet Power Status: Ramping from Injection to Store: BDMC = 671.69 amps, BQMC = 637.85 amps.

DX Heaters: None fired.

**Technical Notes / Sequence of Events:** Postmortem shows large current spikes on b2-q6-ps at 2.6 amps while ramping up prior to T=zero causing the 2b-qd1 quench detector to trip. *G Heppner*

**05:07** Spikes seen in the current output on b2-q6 before the latest blue QLI. This sounds like the issue that started on Jan 19th. The latest info in yesterday's log shows that that housekeeping power supply was replaced during maintenance. We're speaking with Don Bruno right now. -JPJ, NAK [quench]

**05:17** Don has asked Support to swap out the voltage regulator card. In the meantime, we're shutting off the supply for a few minutes in the hopes of improving the power supply regulation. -JPJ

**05:32** Support hasn't swapped out the voltage regulator card on b2-q6 since it's time for their shift change. We're trying to run quench recovery now anyway, since the supply has been off for a few minutes. -JPJ, NAK

QLI Recovery TAPE Start: 05:27:24      Link Recovered Time: 05:35:27      Estimated Down Time: 38 minutes

**Quench Analysis: b2-q6-ps (Power Supply cycled to OFF)**  
**(Counter = IR Power Supply)**

**Wednesday-February 02, 2005: PR-046, Blue Quench: File# = 1107340904**

Permit ID: 2b-ps1      Timestamp: 05:41:44 +986117      Beam Permit Fail Timestamp: 05:41:44 +986146

QPAControl / Timing Resolver: No faults indicated, b-QD first to trip.

Quench Detector(s) Trip: 2b-qd1, B1QFQ2\_VT, Int. 1, Tq - 24, no auxiliary trips.

5 Minute: Quench Delay File: No indications, Systems Running.

Beam Loss Monitors (Rads/Hr): Minimal in this sector.

Main Magnet Power Status: Ramping from Injection to Store: BDMC = 712.66 amps, BQMC = 676.68 amps.

DX Heaters: None fired.

**Technical Notes / Sequence of Events:** Postmortem shows large current spikes on b2-q6-ps at 3.3 amps while ramping up prior to T=zero causing the 2b-qd1 quench detector to trip. *G Heppner*

*Physics Log:* b2-q6 again. We'll have Support swap out the voltage regulator card now. -JPJ [quench] 05:46:38 rhic quench interlock. MCR and D. Bruno request we replace the voltage regulator module in ps for b2q6. Work is in progress. -heg [rhic]

**06:24** Support finished swapping out the card for b2-q6.

QLI Recovery TAPE Start: 06:22:37      Link Recovered Time: 06:30:28      Estimated Down Time: 48 minutes

**Quench Analysis: b2-q6-ps (Voltage Regulator Card swapped)**  
**(Counter = IR Power Supply)**

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**Wednesday-February 02, 2005: PR-047, Blue Quench: File# = 1107344132**

Permit ID: 2b-ps1      Timestamp: 06:35:32 +52707      Beam Permit Fail Timestamp: 06:35:32 +52736

QPAControl / Timing Resolver: No faults indicated, b-QD first to trip.

Quench Detector(s) Trip: 2b-qd1, B1QFQ3\_VT, Int. 1, Tq – 24, no auxiliary trips

5 Minute: Quench Delay File: No indications, Systems Running.

Beam Loss Monitors (Rads/Hr): Minimal in this sector.

Main Magnet Power Status: Ramping from Injection to Store: BDMC = 700.26 amps, BQMC = 664.95 amps.

DX Heaters: None fired.

**Technical Notes / Sequence of Events:** Postmortem shows large current spikes on b2-q6-ps at 2.54 amps while ramping up prior to T=zero causing the 2b-qd1 quench detector to trip. *G Heppner*

*Physics Log:* b2-q6 again. Don is instructing Support on swapping out the firing card. -JPJ [quench]

QLI Recovery TAPE Start: 07:17:21      Link Recovered Time: 07:25:20      Estimated Down Time: 49 minutes

**Quench Analysis: b2-q6-ps (Firing Card swapped)**

**(Counter = IR Power Supply)**

**Wednesday-February 02, 2005: PR-048, Blue Quench: File# = 1107347543**

Permit ID: 2b-ps1      Timestamp: 07:32:20 +3618975      Beam Permit Fail Timestamp: 07:32:20 +3619004

QPAControl / Timing Resolver: No faults indicated, b-QD first to trip.

Quench Detector(s) Trip: 2b-qd1, B1QFQ3\_VT, Int. 1, Tq – 24, no auxiliary trips.

5 Minute: Quench Delay File: No indications, Systems Running.

Beam Loss Monitors (Rads/Hr): Minimal in this sector.

Main Magnet Power Status: Ramping from Injection to Store: BDMC = 765.52 amps, BQMC = 726.56 amps.

DX Heaters: None fired.

**Technical Notes / Sequence of Events:** Postmortem shows large current spikes on b2-q6-ps at 5.4 amps while ramping up prior to T=zero causing the 2b-qd1 quench detector to trip. *G Heppner*

QLI Recovery TAPE Start: 08:24:11      Link Recovered Time: 08:40:06      Estimated Down Time: 68 minutes

**Quench Analysis: b2-q6-ps (Now try ZFCT Card)**

**(Counter = IR Power Supply)**

**Wednesday-February 02, 2005: PR-049, Blue Quench: File# = 1107352314**

Permit ID: 2b-ps1      Timestamp: 08:51:52 +2018426      Beam Permit Fail Timestamp: 08:51:52 +2108455

QPAControl / Timing Resolver: No faults indicated, b-QD first to trip.

Quench Detector(s) Trip: 2b-qd1, B1QFQ2\_VT, Int. 1, Tq – 24.

5 Minute: Quench Delay File: No indications, Systems Running.

Beam Loss Monitors (Rads/Hr): Minimal in this sector.

Main Magnet Power Status: Ramping from Injection to Store: BDMC = 2440.49 amps, BQMC = 2306.85 amps.

DX Heaters: None fired.

**Technical Notes / Sequence of Events:** After replacing the ZFCT Card and running a Hysteresis Ramp, Postmortem shows large current spikes and Voltage changes on b2-q6-ps at 30.5 amps while ramping up prior to T=zero causing the 2b-qd1 quench detector to trip. *G Heppner*

*Physics Log:* b2-q6-ps has been swapped out and a hysteresis ramp has been completed. -Don Bruno [blue] [ps].

QLI Recovery TAPE Start: 11:41:44      Link Recovered Time: 11:50:01      Estimated Down Time: 178 minutes

**Quench Analysis: b2-q6-ps (Replaced entire Power Supply)**

**(Counter = IR Power Supply)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

**Wednesday-February 2, 2005: PR-050, Blue Quench: File# = 1107379094**

Permit ID: 11b-ps1      Timestamp: 16:18:12 +2300154      Beam Permit Fail Timestamp: 16:18:12 +2255403

QPAControl / Timing Resolver: No faults indicated, b-QD first to alarm.

Quench Detector(s) Trip: 11b-qd1, B10DSA4\_A3VT, Int. 1, Tq -24

5 Minute: Quench Delay File: 10a-qd1, B10QFQ4\_6VT (q4, q5 and q6)

11b-qd1, B10DSA4\_A3VT (arc dipole D15 thru D20)

Beam Loss Monitors (Rads/Hr): Sector 10: b10-lm4 = 4970.04, g10-lm5 = 4619.54, g10-lm6 = 4739.10, g10-lm7 = 4728.64, g10-lm8 = 4818.65, g10-lm10 = 4937.68, g10-lm16 = 4439.47, g10-lm20 = 4933.59

DX Heaters: No indications that any fired.

Main Magnet Power Status: Almost to Store Energy, tripping at:

BDMC = 4305.48 amps, BQMC = 4006.18 amps (b-dmain-ps, Current Monitor Alarm)

**Technical Notes / Sequence of Events:** There was no indication of a power supply at fault prior to the quench. The Blue Quench link trip was caused by the 11b-qd1-quench detector. The quench detector tripped because of a real magnet quench at B10DSA4\_A3VT. The beam permit tripped .044 sec. before the quench link. There were two real magnet quenches at b10q4 and the b10 arc dipole. There was high beam loss at g10-lm5, g10-lm6, g10-lm7, g10-lm8, g10-lm10, g10-lm16, g10-lm20. There are now 19 beam induced quenches for this run. *G Heppner*

Physics Log: For the last ramp - some untested changes in the last 4 stones were reverted. Beam in nevertheless lost before t260 (that did not happen in long while..). So for the next ramp (after the 1 hour access granted to Phobos and the RF group to undo previous changes) Todd will revert the entire ramp to a successful weekend ramp with Phobos in Polarity B. *-Fulvia*

QLI Recovery TAPE Start: 17:48:17

User Invoked Resume: ERROR bo10-tq6-ps stayed at standby (communications error)

QLI Recovery TAPE Start: 18:00:13      Link Recovered Time: 18:00:13 **Re-check**      Estimated Down Time: 102 minutes

**Quench Analysis: Beam Induced Quench #019**

**(Counter = Beam Induced)**

**Wednesday-February 02, 2005: PR-051, Yellow Quench: File# = 1107381254**

Permit ID: 7b-ps1      Timestamp: 16:54:12 +1287601      Beam Permit Fail Timestamp: N/A

QPAControl / Timing Resolver: No Archive files available.

Quench Detector(s) Trip: No Archive files available.

5 Minute: Quench Delay File: No Archive files available.

Beam Loss Monitors (Rads/Hr): No Beam in the Machine.

Main Magnet Power Status: Ramping from Injection to Store: YDMC = 447.45 amps, YQMC = 419.87 amps.

**Technical Notes / Sequence of Events:** At first, no data appeared anywhere except on Qdplots. Cause for the trip was the use of the wrong Slowfactor when ramping Yellow down. *G Heppner*

Physics Log: From BSB, ramping here2zero. Apparently the WFG manager does not set this slow factor automatically. *-TJS*, BSB, Ran compramp.tcl Cu8\_1107221571 Cu8 to restore ramp to settings from ramp 6045, Mon Jan 31 20:39. It should be noted that the ONLY differences between this ramp and the existing ramp are in injection and store stones -- there are no other differences on the ramp. *-TJS*. Activated and reran compramp; this revert looks good. *-TJS*

QLI Recovery TAPE Start: 17:03:01      Link Recovered Time: 17:10:33      Estimated Down Time: 17 minutes

**Quench Analysis: Wrong Slowfactor from Injection to Park**

**(Counter = Operator Error)**



***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

***Monday-February 7, 2005: PR-052, Yellow Quench: File# = 1107781475***

Permit ID: **5b-ps1**      Timestamp: **08:04:32 +3820395**      Beam Permit Fail Timestamp: **08:04:32 +861479**

QPAControl / Timing Resolver: N/A

Quench Detector(s) Trip: 5b-qd1, Y5DSA3\_A2VT, Int. 20, Tq - 24

5 Minute: Quench Delay File: No indications, systems running.

Beam Loss Monitors (Rads/Hr): Sector 5: g5-lm21 = 1298.08, g5-lm20 = 4959.37 (.391 sec)  
g5-lm19 = 4659.25 (.267 sec), g5-lm18 = 4825.29 (.725 sec)  
g5-lm17 = 4839.53 (.472 sec), g5-lm16 = 1642.30, g5-lm8 = 1738.77  
g5-lm3.2 = 1365.14

Main Magnet Power Status: ramping from Injection to Store when tripping: YDMC = 959.55amps, YQMC = 910.24amps

**Technical Notes / Sequence of Events:**

This yellow quench link trip was caused by the 5b-qd1 quench detector. The quench detector tripped because of a real magnet quench between arc magnets D16 through D20. The beam permit tripped 2.95 seconds before the quench link. There were high beam losses at g5-lm16, g5-lm17, g5-lm18, g5-lm19, and g5-lm20 for over 0.3 sec. The qdRealQuench pet page did not show this as a real quench because this pet page is not as reliable at low current operation. There are now 20 beam induced quenches for this run. There were no problems with any power supply prior to the quench. -Don Bruno [quench]

Good job Don! I concur. Additional note, TAPE seemed to have problems with receiving data from the Yellow Main Dipole Power Supply when bringing the link up. No problems with the mains, there must have been a controls problem receiving the information. At the time of this writing, I did not see any complaints within the logs. *G Heppner*

Physics Log: 2005-Feb-07 08:30:00 Yellow quench link interlock was cause by the Yellow RF Acceleration Cavities tripping off, causing beam to de-bunch and abort.

QLI Recovery TAPE Start: **08:26:35** (08:48:58 Cancel, IO lib - Cannot get any of the data, y-dmain-ps)

Link Recovered Time: **08:47:10 Supplies On.**      Estimated Down Time: **43** minutes

**Quench Analysis: Beam Induced Quench #020**  
**(Counter = Beam Induced)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

***Monday-February 7, 2005: PR-053, Yellow Quench: File# = 1107810578***

Permit ID: 8b-ps1      Timestamp: 16:09:36 +2040658      Beam Permit Fail Timestamp: 16:09:36 +2040688

QPAControl / Timing Resolver: no faults indicated, yellow quench detector first.

Quench Detector(s) Trip: 8b-qd2, Y7QFQ2\_VT, Int. 1, Tq – 24

Auxiliary Quench Detector: 11b-qd1, YI11-SXD-VT, Int. 100 at 16:09:29

5 Minute: Quench Delay File: 8b-qd2, Y7QFQ2\_VT

Beam Loss Monitors (Rads/Hr): Sector 7:

y7-lm3.2 = starting at 8 ½ seconds prior to T=zero, Beam intensity drastically increased from 4.15 to 5268.50 in 4 ½ seconds peaking out at 6551.41

y7-lm2.1 = starting at 8 ½ seconds prior to T=zero, Beam intensity drastically increased from 5.54 to 2535.52 in 4 ½ seconds peaking out at 2950.72

Main Magnet Power Status: Store Energy: YDMC = 4309.07amps, YQMC = 4017.13amps

**Technical Notes / Sequence of Events:** QPA Control: QP02-R11B07-yi11-sxd-qp, Crowbar, cfe-11b-ps2.

This yellow quench link trip was caused by the yi11-sxd-ps tripping. This sextupole p.s. tripped because the maximum ramp rate of 0.2A/s was exceeded. It was ramped at about 0.7A/s. The sextupole p.s. tripped about 11 seconds before the yellow qli occurred. Once the sextupole p.s. trips it takes about 17 seconds for the current to decay down to zero. It was the 8b-qd2 quench detector that tripped the yellow quench link. The quench detector tripped because of a real magnet quench at Y7Q2. The quench link tripped 1us before the permit. There was high beam loss (5000 rad/hr) at y7-lm3.2 for over 4 seconds before the trip. Is the threshold for this beam loss monitor set correctly? There are now 21 beam induced quenches for this run. -Don Bruno [quench]

Good job Don! I concur. Additional note, TAPE again had problems receiving data from the Yellow Main Dipole Power Supply when bringing the link up. Also, Postmortems show the following supplies (yi7-qf1, yi7-qd2, yi7-qf3) current / voltage changes corresponding to the Magnet quench at y7q2, triplet region. G Heppner

Physics Log: (17:03) Talked to Don about the sextupole quench. It would not recover from regular recovery procedure. He is working with George to recover it and no estimate at this point. He also believe that slow factor of 1 is a little too fast for this manget due to lack of training. -Haixin

(17:18) I did not recover the sextupole p.s. yi11-sxd-ps, I think MCR did. -Don Bruno [yellow] [ps]

(17:15) I ramped yi11-sxd-ps to 20A and let it sit there for 10 minutes to train the quench detector at a higher current. I don't know if that will help when the sextupoles are being wiggled but under normal operation this p.s. should be fine. If it still trips when being wiggled, the quench detector may need to have the inductance re-tuned. -Don Bruno [yellow] [ps]

(17:30) yi11-sxd-ps was being ramped at 0.7A/s. The limit is 0.2A/s. If it must be ramped faster then time would have to be given to re-tune the inductance in the quench detector. -Don Bruno [yellow] [ps]

QLI Recovery TAPE Start: 16:25:57 (16:38:55 Exit, IO lib – Cannot get any of the data, y-dmain-ps)

Link Recovered Time: 16:40:42, **Supplies On.**      Estimated Down Time: 31 minutes

**Quench Analysis: Beam Induced Quench #021**  
**(Counter = Beam Induced)**



***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

***Tuesday-February 08, 2005: PR-054, Blue Quench: File# = 1107887972***

Permit ID: 12a-ps1.A    Timestamp: 13:39:32 +737277    Beam Permit Fail Timestamp: 13:39:32 +698172

QPAControl / Timing Resolver: No faults indicated, b-QD first to trip.

Quench Detector(s) Trip: 12a-qd1, B11QFQ2\_VT, Int. 1, Tq -24

5 Minute: Quench Delay File: 12a-qd1, B11QFQ2\_VT

Beam Loss Monitors (Rads/Hr): sector 10: g10-lm20 = 3754.88

Sector 11: g11-lm21 = 852.50, g11-lm20 = 596.21, b11-lm3.1 = 1961.61, g11-lm1 = 10117.96, b11-lm0 = 4182.61

Main Magnet Power Status: Store Current, Qdplots indicate tripping before T=zero.

Status after Quench Event: b-dmain-ps, Current Mon

DX Heaters: None fired.

**Technical Notes / Sequence of Events:** Postmortem plots show Current / Voltage Quench Laws in affect for bo11-qd1, bo11-qf2 and bo11-qd3. Snapshot plot indicates that bo11-th2-ps (Over Voltage) quenched (13:39:55) 23 seconds after b11q2 magnet suffered a beam induced quench, most likely due to the slow dissipation of hot gasses. *G Heppner*

There was no indication of a power supply at fault prior to the quench. The 12a-qd1-quench detector caused blue Quench link to trip. The quench detector tripped because of a real magnet quench at B11QFQ2\_VT. The beam permit tripped .039 sec. before the quench link. There where two real magnet quenches: b11q2 and bo11-th2. There was high beam loss at g11-lm1 and b11-lm0. There are now 22 beam induced quenches for this run. *G Heppner*

Physics Log: (13:41) Blue Kicker missed the gap, it seems. Pre-fire on Ch4? *Gjm*

(14:14) Cryogenics gives permission to resume operations.

QLI Recovery TAPE Start: 13:58:45    Link Recovered Time: 14:06:18    Estimated Down Time: 26 minutes

**Quench Analysis: Beam Induced Quench #022**

**(Counter = Beam Induced)**

***Wednesday-February 09, 2005: PR-055, Blue Quench: File# = 1107957060***

Permit ID: 12a-ps1.A    Timestamp: 08:51:00 +759222    Beam Permit Fail Timestamp: 08:51:00 +759252

QPAControl / Timing Resolver: QP07-R12ABQF5-b12-q7-qp, Fan Fault.

Quench Detector(s) Trip: All Main Detectors tripped indicating positive Tq values, no auxiliary trips.

5 Minute: Quench Delay File: No indications, Systems Running.

Beam Loss Monitors (Rads/Hr): Sector 9 and 10 Aborts normal.

Main Magnet Power Status: Steady at Store Energy: BDMC = 4308.37 amps, BQMC = 4011.36 amps.

Blue Main Dipole indicated a Current Monitor Fault.

DX Heaters: None fired.

**Technical Notes / Sequence of Events:** There was no indication of a power supply at fault prior to the quench. The Blue Quench Link dropped due to a QPA Fan Fault for b12-q7-qpa. The beam permit tripped 30 u sec. after the quench link. This QPA houses Prototype switches that are of the sealed tight type. (Note: Larger fan paddles had been specially made because the switch required a greater surface area in order to close, possible air flutter?) Tech Team found nothing wrong as they hooked up a QPA Tester and everything cleared as should. Testing of the connections showed no loose crimps so they re-positioned the switch so the paddle would catch more air flow. *G Heppner*

QLI Recovery TAPE Start: 09:36:02    Link Recovered Time: 09:43:40    Estimated Down Time: 53 minutes

**Quench Analysis: b12-q7-qpa (Fan Fault)**

**(Counter = QPA)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

***Friday-February 11, 2005: PR-056, Blue Quench: File# = 1108130420***

Permit ID: 2b-ps1      Timestamp: 09:00:20 +383076      Beam Permit Fail Timestamp: 09:00:20 +383077

QPAControl / Timing Resolver: No faults indicated, b-QD first to trip.

Quench Detector(s) Trip: 2b-qd1, B2/1DX\_DX, Int. 20, Tq -20

5 Minute: Quench Delay File: 2b-qd1, B1DRDX\_VT

Beam Loss Monitors (Rads/Hr): No beam in sector 1 or sector 2. Appears as a proper Beam Abort for Blue.

Main Magnet Power Status: Store Current, BDMC = 4308.37 amps, BQMC = 4011.18 amps

Status after Quench Event: b-dmain-ps, Current Mon

DX Heaters: 2b-ps2.A2 and 2b-ps2.B2 Fired

**Technical Notes / Sequence of Events:** There was no indication of a power supply fault. The b2-dh0 and b2-dhx power supplies indicated a voltage induction taking place prior to the T=zero mark.

The blue quench link tripped due to the 2b-qd1 quench detector. The quench detector tripped because of the signal in B2/1DX\_DX. There was a Real Magnet quench at B1DRDX. Alarm Log indicated that the Brahms D3 Magnet had tripped on a Security Trip, AC Fault and Component Fault at 08:53:15. Log View indicates that the supply ramped up at turn on causing a voltage induced into the b2dx. This D3 magnet is next to the b2dx magnet. George Ganetis had confirmed this type of fault during the last run. *G Heppner*

QLI Recovery TAPE Start: 10:18:11      Link Recovered Time: 10:28:37      Estimated Down Time: 89 minutes

**Quench Analysis: Magnet Quench at Blue 1DX, Heaters fired due to the Brahms D3 Magnet.**  
**(Counter = Other)**

***Sunday-February 13 2005: PR-057, Blue Quench: File# = 1108294605***

Permit ID: 10a-ps3.A      Timestamp: 06:36:44 +1708694      Beam Permit Fail Timestamp: 06:36:44 +1565540

QPAControl / Timing Resolver: No faults indicated.

Quench Detector(s) Trip: 10a-qd1, B10QFQ4\_6VT, Int. 1, Tq -25

5 Minute: Quench Delay File: 10a-qd1, B10QFQ4\_6VT

12a-qd1, B11QFQ2\_VT

Beam Loss Monitors (Rads/Hr): Sector 10: b10-lm4 = 4969.73, g10-lm5 = 4619.25, g10-lm6 = 4738.37, g10-lm7 = 2739.31, g10-lm12 = 4859.24, g10-lm20 = 5149.67, Sector 11: g11-lm1 = 1764.12

DX Heaters: No indications that any fired.

Main Magnet Power Status: Store energy, b-dmain-ps, (Current Monitor Alarm)

**Technical Notes / Sequence of Events:**

Postmortems show bo10-qd1, bo10-qf2, bo10-qd3, bo10-qf6 and bo10-qd7 reacting to the laws of a magnet quench. (Voltage / Current Curve all before T=zero) *G Heppner*

Blue quench link trip was caused by 10a-qd1 quench detector. The quench detector tripped because of a real magnet quench at B10QFQ4\_6VT. The beam permit tripped .143 sec before the quench link. There were real magnet quenches at b10q4 and b11q2. There was a high beam loss at g7-lm1 and a moderate loss at g11-lm1. There were no problems with any power supply prior to the quench. . There is now 23 beam induced quench for this run. -Ganetis [quench]

Physics Log: 08:00:00 The Blue Rf cavities had tripped off on a vacuum fault during the previous store which caused the beam to de-bunch and in turn caused the Blue QLI. There were no vacuum data available in Log View for further investigation. The CAS crew was able to bring on the cavities.

QLI Recovery TAPE Start: 07:19:39      Link Recovered Time: 07:27:14      Estimated Down Time: 50 minutes

**Quench Analysis: Beam Induced Quench #023**  
**(Counter = Beam Induced)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

***Monday-February 14 2005: PR-058, Yellow Quench: File# = 1108375654***

Permit ID: 4b-timeB      Timestamp: 05:07:32 +2689956      Beam Permit Fail Timestamp: 05:07:32 +2689960

QPAControl / Timing Resolver: No faults indicated.

Quench Detector(s) Trip: 4b-qd2, Aux 5, Y4TQ6\_VT, Int. 1

5 Minute: Quench Delay File: None, systems running

Beam Loss Monitors (Rads/Hr): Beam Abort looks clean, slight low levels.

Main Magnet Power Status: Zero Currents, (y-dmain-ps, Regulator DCCT Alarm)

**Technical Notes / Sequence of Events:** There was nothing found wrong with the power supplies. It was believed that the Replacement Team had turned off the Yellow Main Dipole Flattop power supply in order to swap out the yo4-tq4-qpa that had been tripping multiple times. The procedure for working on the Tq supplies does not require taking down the Main Link since they are independent of the Main Link. After further Analysis, CAS said they did not turn off the mains, so it may well be a problem with the Main Yellow Dipole Regulator as this supply was sitting at zero current from 03:59 and this was the only fault listed after the quench event occurred. (Regulator DCCT). *G Heppner*

QLI Recovery TAPE Start: 05:22:22      Link Recovered Time: 05:30:02      Estimated Down Time: 8 minutes

**Quench Analysis: Undetermined, future testing required.**

**(Counter = Other)**

***Monday-February 14, 2005: PR-059, Blue Quench: File# = 1108401872***

Permit ID: 8b-ps1      Timestamp: 12:24:32 +693105      Beam Permit Fail Timestamp: 12:24:32 +644184

QPAControl / Timing Resolver: Res: No faults indicated, blue quench detector tripped first.

Quench Detector(s) Trip: 8b-qd1, B7QFQ3\_VT, Int. 1, Tq -24

5 Minute: Quench Delay File: 8b-qd1, B7QFQ3\_VT, B7QFQ2\_VT, B7DRD0-D0

Beam Loss Monitors (Rads/Hr): BLM losses seen in several sectors, Sector 7 is where the magnets had quenched:

y7-lm3.2 = 10561.89, b7-lm3.1 = 44856.72, y7-lm3.1 = 29393.02, y7-lm2.1 = 45354.24, b7-lm2.1 = 47947.41,  
g7-lm1 = 46129.02, y7-lm0 = 4798.37, b7-lm0 = 4633.51, b7-lmx = 6349.66, y7-lmx = 3186.21, g7-lmx = 1782.44,  
g7-mlmx.1 = 4655.85, g7-mlmx.2 = 4703.57

Main Magnet Power Status: BDMC = 4308.37 amps, BQMC = 4010.73 amps (b-dmain-ps = Current Monitor)

DX Heaters: None fired.

**Technical Notes / Sequence of Events:** Beam Studies. Postmortems show bo7-qd1, bo7-qf2 and bo7-qd3 reacting to the laws of a magnet quench. (Voltage / Current Curve all before T=zero) *G Heppner*

There was no indication of a power supply at fault prior to the quench. The Blue Quench Link trip was due to the 8b-qd1-quench detector. The quench detector tripped because of real magnet quenches at B7QFQ3\_VT, B7QFQ2\_VT and B7DRD0-D0. The beam permit tripped .049 sec. before the quench link. There were three real magnet quenches: b7q3, b7q2 and b7d0. (February 15, 2005, Editors Note: Additional magnets quenched during this event where corrector magnets bo7-qs3 and bo7-th2. Bring the total Magnets Quenched to 5) There was high beam loss at b7-lm3.1, b7-lm2.1, g7-lm1 and b7-lm0. There are now 24 beam induced quenches for this run. *G Heppner*

Physics Log: No plan to work at store for next beam. Fulvia can use the blue beam, for IR correction. -Yun

MCR Log: Both quench links dropped during an AC dipole kicker study (the blue link dropped first). Several voltage taps in 8 o'clock indicate real quenches.

QLI Recovery TAPE Start: 12:47:43      Link Recovered Time: 12:55:43      Estimated Down Time: 31 minutes

**Quench Analysis: Beam Induced Quench #024**

**(Counter = Beam Induced)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

***Monday-February 14, 2005: PR-060, Yellow Quench: File# = 1108401873***

**Permit ID: 8b-ps1**      **Timestamp: 12:24:32 +1233280**      **Beam Permit Fail Timestamp: 12:24:32 +644184**

**QPAControl / Timing Resolver:** No faults indicated, yellow quench detector tripped first.

**Quench Detector(s) Trip:** 8b-qd2, Y7DRD0\_D0, Int. 5, Tq -23

**5 Minute: Quench Delay File:** None indicated for yellow, only Blue Magnets.

**Beam Loss Monitors (Rads/Hr):** BLM losses seen in several sectors, Sector 7 is where the magnets had quenched:

y7-lm3.2 = 10561.89, b7-lm3.1 = 44856.72, y7-lm3.1 = 29393.02, y7-lm2.1 = 45354.24, b7-lm2.1 = 47947.41,  
g7-lm1 = 46129.02, y7-lm0 = 4798.37, b7-lm0 = 4633.51, b7-lmx = 6349.66, y7-lmx = 3186.21, g7-lmx = 1782.44,  
g7-mlmx.1 = 4655.85, g7-mlmx.2 = 4703.57

**Main Magnet Power Status:** At Store Energy of YDMC = 4309.07 amps, YQMC = 4017.88 amps  
(y-qmain-ps = Current Monitor)

**Technical Notes / Sequence of Events:** Beam Studies.

There was no indication of a power supply at fault prior to the quench. The Yellow Quench Link trip was due to the 8b-qd2-quench detector. The quench detector tripped because of real magnet quench at Y7DRD0\_D0. The beam permit tripped .589 sec. before the quench link. There was a real magnet quench at y7d0. There were high beam loss at y7-lm0. There are now 25 beam induced quenches for this run. *G. Heppner*

Correction: Initially I called this a Beam Induced quench but after further review from the re-play booth (Consulting with George Ganetis) it was determined that the call on the field be reversed. The Yellow Quench Link trip was due to the 8b-qd2-quench detector. The quench detector tripped because of magnetic coupling between the b7dh0 and the y7dh0 that induced a voltage into the y7dh0 quench detection signal. Radiation levels in this area had been high, the reason for the Blue Beam Induced Quench Event. There was no indication of power supplies at fault prior to the quench. The beam permit tripped .589 sec. before the quench link. Therefore, there was not a real magnet quench at y7d0 and the Beam Induced Quenches remains at 24 for now. -G. Heppner [rhic] [quench]

**Physics Log:** No plan to work at store for next beam. Fulvia can use the blue beam, for IR correction. -Yun

This quench was due to operation error: tune quads were moved and the betatron tune was very close to ac dipole drive tune. When ac dipole fired, it generated a lot crackers.... -Haixin

**MCR Log:** Both quench links dropped during an AC dipole kicker study (the blue link dropped first). Several voltage taps in 8 o'clock indicate real quenches.

**QLI Recovery TAPE Start:** 12:33:23 (paused because yo9-qf2-ps indicated Stby during the final ON check)

**Link Recovered Time:** 12:45:39      **Estimated Down Time:** 21 minutes

**Quench Analysis: Magnetic Coupling between b7dh0 and y7dh0.**  
**(Counter = Other)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

**Scheduled Maintenance 08:00 to 16:00**

**Wednesday-February 16, 2005: PR-061, Blue and Yellow Quench Files:**

**File# = 1108567829**      **Permit ID: Blue 4b-time.B**      **Timestamp: 10:30:28 +1303865**

**Cause:** Mains Crash Button pushed for maintenance day.

**File# = 1108567833**      **Permit ID: Yellow: 4b-time.B**      **Timestamp: 10:30:32 +1475551**

**Cause:** Mains Crash Button pushed for maintenance day.

**Main Magnet Power Status:** Park Currents.    **DX Heaters:** None fired.

**Technical Notes / Sequence of Events:**

**18:36, RHIC ps Maintenance performed today:** 1. Checked connections on magnets of p.s. bi5-qs-ps. All were tight. 2. Re-stripped and reconnected the p.s. cable leads at the magnet tree of yo8-dod3-ps. 3. Ran some snake and rotator p.s.'s up to operating current. 4. Swapped 3 channel isolation amplifier boards of yi3-qf1-ps and yo4-qf8-ps. 5. Examined gate drive connections of yi3-qf1-ps. All is tight. 6. Swapped out fiber optic interface card of y2-dh0-ps. 7. Swapped out current regulator card of bi12-qf9-ps. 8. Installed new heaters on Dx magnet tree. 9. Re-trained sextupole p.s. quench detectors because they were rebooted. 10. Installed new ac line monitor for y2-q7-ps. -Don Bruno [rhic] [ps]

**Blue Recovery TAPE Start: 17:41:13**      **Link Recovered Time: 17:50:11**      **Down Time for Blue: 440 minutes**

**Yellow Recovery TAPE Start: 16:56:45**      **Link Recovered Time: 17:05:35**      **Down Time for Yellow: 396 minutes**

**Quench Analysis: Scheduled Maintenance**

**(Counter = Maintenance)**

**Thursday- February 17, 2005: PR-062, Yellow Quench: File# = 1108617312**

**Permit ID: 2b-ps1**      **Timestamp: 00:15:12 +791524**      **Beam Permit Fail Timestamp: 00:15:12 +791525**

**QPAControl / Timing Resolver:** QP11-R2BD1-y2-dh0-qp first, no faults indicated.

**Quench Detector(s) Trip:** 2b-qd2, Y2DRD0\_D0, Int. 1, Tq +1226 (only one indicated, all other systems running)

**5 Minute: Quench Delay File:** None indicated, all systems running..

**Beam Loss Monitors (Rads/Hr):** No beam in the machine.

**Main Magnet Power Status:** At Zero Current.

**Technical Notes / Sequence of Events:** y2-dh0-ps, Stby-Error, AC Power, Standby, Remote, Error signal, Quench, AC Phase

**Physics Log:** *Started Wednesday, February 16 at 23:48:* y2-dh0 took off ~8 amps from setpoint, then snapped back to normal. After the beam dumped, of course. -gjm, CEN 23:55, that's a new (to my memory at least) failure mode that should warrant a call to Don.... -Fulvia February 17, at 00:03: We're way ahead of you. Ramping to zero so CAS can swap back a fiber optic card. -gjm 23:57: Dumping Beam and ramping down. 00:16: Dropped link by putting y2-dh0 in standby, so that CAS could make the repair. -gjm 00:40: After recovering the link y2-dh0 is repeating its wayward drift at injection. Don asks for a hysteresis ramp. -gjm

**QLI Recovery TAPE Start: 00:18:20**      **Link Recovered Time: 00:26:42**      **Estimated Down Time: 12 minutes**

**Quench Analysis: y2-dh0-ps current drift.**

**(Counter = IR Power Supply)**

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

***Thursday-February 17, 2005: PR-063, Yellow Quench: File# = 1108620644***

Permit ID: **2b-ps1**      Timestamp: **01:10:44 +887487**      Beam Permit Fail Timestamp: **01:10:44 +887488**

QPAControl / Timing Resolver: QP11-R2BD1-y2-dh0-qp first, no faults indicated.

Quench Detector(s) Trip: 2b-qd2, Y2DRD0\_D0, Int. 1, Tq +1226 (only one indicated, all other systems running)

5 Minute: Quench Delay File: None indicated, all systems running..

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Main Magnet Power Status: At Zero Current.

**Technical Notes / Sequence of Events:** y2-dh0-ps, Off, AC Power, Remote

Summary of what happened with RHIC p.s.'s this morning

- 1) Y2-dh0 setpoint drifted causing beam abort
- 2) We had swapped the fiber optic interface card out during maintenance because of this problem in the past.
- 3) I had CAS (Charles and Joe) put the original fiber optic interface card back in. The problem was still there.
- 4) I had CAS swap out the current regulator card and housekeeping p.s.
- 5) I also had CAS remove and reseal all the connections on the 3u control chassis backplane.
- 6) After CAS was done MCR tried bringing the yellow link up but it would not come up because one of the housekeeping p.s. connectors was not on correctly so CAS had to go back out to fix it.
- 7) In trying to recover the yellow link a new problem developed. Y2-q6-ps quench fault would not reset.
- 8) I had CAS go back out to 1002B and reseal two D connectors on the qpa y2-q6-qp, one D connector on the p.s. y2-q6-ps and also pull the 120Vac cord qpa to y2-q6-qp and plug it back in.
- 9) The yellow links now came up.
- 10) MCR did a hysteresis ramp and y2-dh0-ps setpoint looked much better.
- 11) During the next store you might want to keep an eye on the setpoint of y2-dh0-ps. If this problem is not fixed it may show up after sitting at store for awhile like last time.
- 12) If the problem does not return this morning we will continue to monitor y2-dh0-ps to make sure the problem does not return.
- 13) Charles and Joe did a very nice job working on this. -Don Bruno [rhic] [ps]

Physics Log: set y2-dh0 off to trip the link for more repairs by CAS... -gjm

QLI Recovery TAPE Start: **01:58:32** (paused because y2-dh0-ps indicated Stby-Error during check for standby)

QLI Recovery TAPE Start: **02:24:44** (during quench for Enabled check, paused due to 2b-qd2 tripped fault).

QLI Recovery TAPE Start: **02:31:33** (paused because y2-q6-ps indicated Stby-Error during check for standby)

QLI Recovery TAPE Start: **03:16:10**      Link Recovered Time: **03:23:56**      Estimated Down Time: **133** minutes

**Quench Analysis: y2-dh0-ps current drift.**

**(Counter = IR Power Supply)**



***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

***Thursday-February 17, 2005: PR-064, Yellow Quench: File# = 1108664400***

Permit ID: 8b-ps1      Timestamp: 13:20:00 +300015      Beam Permit Fail Timestamp: 13:20:00 +181198

QPAControl / Timing Resolver: No faults indicated, Yellow Quench Detector y-QD QLI first to trip.

Quench Detector(s) Trip: 8b-qd2, Y7QFQ2\_VT, Int. 1, Tq -24 no auxiliary trips.

5 Minute: Quench Delay File: 8b-qd2, Y7QFQ2\_VT (y7q2 magnet)

Beam Loss Monitors (Rads/Hr): High losses at the Phenix Experiment.

Highest losses for cause of a beam induced quench are: y7-lm3.2 = shows steady increase with greatest starting at T-4seconds. 12000 for over a ½ second, peak value of 45295.85, y7-lm3.1 = 6152.93 and y7-lm2.1 = 35030.86

Main Magnet Power Status: Store Energy: YDMC = 4309.07, YQMC = 4014.59.

Yellow Main Quad PS also indicated a Current monitor status.

Technical Notes / Sequence of Events: Machine / Beam Studies in progress, Physicists working on Orbital correction in blue and yellow, sliding bumps, coupling correction, tunes and chromaticity as seen on the Plan of the day, Run-5 page.

There was no indication of a power supply at fault prior to the quench. The yellow quench link tripped due to the 8b-qd2-quench detector. The quench detector tripped because of a real magnet quench at Y7QFQ2\_VT. The beam permit tripped 0.119 seconds before the quench link. There was one real magnet quench at y7q2. There was high beam loss seen at y7-lm3.2 and y7-lm2.1. There are now 25 beam induced quenches for this run. *G Heppner*

QLI Recovery TAPE Start: 13:32:46 (was paused for no obvious reasons seen)

TAPE Continued: 13:39:43      Link Recovered Time: 13:43:15      Estimated Down Time: 29 minutes

***Quench Analysis: Beam Induced Quench #025***

***(Counter = Beam Induced)***

***Tuesday-February 22, 2005: PR-065, Blue Quench: File# = 1109097100***

Permit ID: 12a-ps1.A      Timestamp: 13:31:40 +309269      Beam Permit Fail Timestamp: 13:31:40 +309270

QPAControl / Timing Resolver: No faults indicated, QP07-R12ABQF5-b12-q7-qpa first to alert.

Quench Detector(s) Trip: All tripped indicating positive Tq values, no auxiliary trips.

5 Minute: Quench Delay File: No indications.

DX Heaters: None fired.

Beam Loss Monitors (Rads/Hr): Sector 10 Blue Dump appeared normal, medium loss near g10-lm8

Main Magnet Power Status: Injection Current: BDMC = 472.94 amps, BQMC = 444.91 amps.

Technical Notes / Sequence of Events: Tripped to the off state: b12-q7-ps, Off, AC Power, Remote, Postmortems verify that b12-q7-ps tripped 0.0152 seconds prior to T=zero. *G Heppner*

Don Bruno and crew to investigate, b12-q7-ps tripped to the OFF state causing this blue QLI. I asked MCR to bring the blue link up and see if it happens again. -Don Bruno [blue] [ps]

QLI Recovery TAPE Start: 13:52:43      Link Recovered Time: 14:00:13      Estimated Down Time: 28 minutes

***Quench Analysis: b12-q7-ps tripped to the off state.***

***(Counter = IR Supply)***

## ***RHIC Physics fy05 Run***

### ***Daily Quench Analysis for the month of February 2005***

#### **Tuesday-February 22, 2005: PR-066, Blue Quench: File# = 1109099109**

Permit ID: 12a-ps1.A      Timestamp: 14:06:28 +2393176      Beam Permit Fail Timestamp: 14:06:28 +2393177

QPAControl / Timing Resolver: No faults indicated, QP07-R12ABQF5-b12-q7-qp first to alert.

Quench Detector(s) Trip: All tripped indicating positive Tq values, no auxiliary trips.

5 Minute: Quench Delay File: No indications.

DX Heaters: None fired.

Beam Loss Monitors (Rads/Hr): Sector 10 Blue Dump shows no beam in the machine.

Main Magnet Power Status: Injection Current: BDMC = 472.94 amps, BQMC = 444.91 amps.

Technical Notes / Sequence of Events: Tripped to the off state: b12-q7-ps, Off, AC Power, Remote, Postmortems verify that b12-q7-ps tripped 0.0125 seconds prior to T=zero. *G. Heppner*

Field Report: b12-q7-ps tripped to the OFF state again causing this blue QLI. We went out to the p.s. and swapped out the control card and digital isolation card. We also reseated the connectors on the housekeeping p.s. and control chassis that may have caused the OFF trip. We also re-soldered a wire that brings the ON status to the control chassis. We also reseated one of the fuses on the housekeeping p.s. that was not fully inserted. -Don Bruno [blue] [ps]

QLI Recovery TAPE Start: 15:12:18      Link Recovered Time: 15:20:07      Estimated Down Time: 74 minutes

**Quench Analysis: b12-q7-ps tripped to the off state.**

**(Counter = IR Supply)**

#### **Wednesday-February 23, 2005: PR-067, Blue Quench: File# = 1109190279**

Permit ID: 6b-ps1      Timestamp: 15:24:36 +3598256      Beam Permit Fail Timestamp: 15:24:36 +3598258

QPAControl / Timing Resolver: No faults indicated, b-QD first to trip.

Quench Detector(s) Trip: 6b-qd1, B5QFQ2\_VT, Int. 1, Tq - 24

Multiple auxiliary trips: 2b-qd1, B2TQ6\_VT, Int. 100, 4b-qd1, B3TQ6\_VT, Int. 100, 6b-qd1, B6TQ6\_VT, Int. 100, 8b-qd1, B7TQ6\_VT, Int. 100, 10a-qd1, B10TQ6\_VT, Int. 100 and 12a-qd1, B11TQ6\_VT, Int. 100.

5 Minute: Quench Delay File: No indications.

DX Heaters: None fired.

Beam Loss Monitors (Rads/Hr): Sector 10 Blue Dump shows no beam in the machine.

Main Magnet Power Status: Ramping to Store: BDMC = 3605.89 amps, BQMC = 3702.93amps

Blue Main Dipole also indicated a Current Monitor Alert

Technical Notes / Sequence of Events: Incredible voltage drops on the phases seen for 1004B 208vac monitors. Carl tells me this is because the mains use a lot of power when ramping and that the 208vac comes from the same 480vac substation. I didn't see an indication of a power supply at fault prior to the quench. Postmortems showed multiple Quad Power supplies Current and voltage changes while Iref and Wfg's continued to ramp. The Blue Quench Link trip was due to the 6b-qd1-quench detector. The quench detector tripped because of the sudden change in the signal at B5QFQ2\_VT. The beam permit tripped 2u-sec. before the quench link. -G. Heppner [blue] [quench] 20:22; There was a problem with bi5-qd2-ps that caused the quench detector to trip. -Ganetis Feb 24, 2005 at 12:21; Thanks George! Even the best NFL Referees had made calls that where overturned. -G. Heppner [rhic] [ps]

Physics / MCR Logs: PSI overflows on q6 magnets, and now it looks like we've QLI'd other magnets. -TJS

The Blue QLI during the hysteresis ramp originating from 6 o'clock. PMViewer showed that a number of the power supplies showed current and voltage drifts before the link was pulled.

Time Line: 15:19, at injection, quadrupoles are now at about 500A, higher than main dipoles instead of lower. -TJS 15:21, Performing hysteresis ramp. -TJS 15:24, when we return to injection with beam, we'll call Rob for TBT IPM measurements, and Todd will work on blue while Vadim works on yellow. We have new ATR match settings from Nick Tsoupas, and we'll also clean up tune and orbit issues in both rings, then attempt a 6x6 ramp if the current hysteresis ramp succeeds. -TJS 15:27, NPL is recovering from the QLI's, and we are analyzing the ramp data to determine what we can about the ramp issues. -TJS

QLI Recovery TAPE Start: 15:37:41      Link Recovered Time: 15:45:14      Estimated Down Time: 20 minutes

**Quench Analysis: bi5-qd2-ps (Unknown at this time)**

**(Counter = IR Supply)**

*Data Researched & Compiled by Gregory P. Heppner*

***RHIC Physics fy05 Run***  
***Daily Quench Analysis for the month of February 2005***

***Wednesday-February 23, 2005: PR-068, Yellow Quench: File# = 1109190349***

Permit ID: 10a-ps3.A    Timestamp: 15:25:48 +1499150    Beam Permit Fail Timestamp: 15:24:36 +3598258

QPAControl / Timing Resolver: No faults indicated, y-QD first to trip.

Quench Detector(s) Trip: 10a-qd2, Y10QDQ9\_VT, Int. 1, Tq – 24

Multiple auxiliary trips: 2b-qd2, Y1TQ6\_VT, Int. 100, 4b-qd2, Y4TQ6\_VT, Int. 100, 6b-qd2, Y6TQ6\_VT, Int. 100, 8b-qd2, Y8TQ6\_VT, Int. 100, 10a-qd2, Y9TQ6\_VT, Int. 100 and 12a-qd2, Y12TQ6\_VT, Int. 100.

5 Minute: Quench Delay File: No indications.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Main Magnet Power Status: Just arrived at store: YDMC = 4309.01 amps, YQMC = 4388.89amps  
Yellow Main Quad also indicated a Current Monitor Alert

Technical Notes / Sequence of Events: I did not see an indication of a power supply at fault prior to the quench. Postmortems also showed multiple Quad Power supplies Current and voltage changes while Iref and Wfg's continued to function normally as did per the previous blue quench event. The Yellow Quench Link trip was due to the 10a-qd2-quench detector. The quench detector tripped because of the sudden change in the signal at Y10QDQ9\_VT. -G. Heppner [yellow] [quench] 20:24; There was a problem with yi10-q89-ps that caused the quench detector to trip. -Ganetis

Physics / MCR Logs: Okay, maybe these aren't the best magnet settings after all. -TJS

The Yellow QLI during the hysteresis ramp originating from 10 o'clock. The yi10-q89 and the yi10-qf9 supplies showed current and voltage fluctuations before the QLI.

George suggests setting slow factor to 2 for the next ramp. We'll try this if necessary, but will work on injection after QLI recovery to have some results for this beam experiment first. -TJS, VP, ST, DT, NPL, NM

QLI Recovery TAPE Start: 15:45:31    Link Recovered Time: 15:53:02    Estimated Down Time: 27 minutes

***Quench Analysis: yi10-q89-ps (Unknown at this time)***  
***(Counter = IR Supply)***

***Wednesday-February 23, 2005: PR-069, Yellow Quench: File# = 1109193021***

Permit ID: 10a-ps3.A    Timestamp: 16:10:20 +1457389    Beam Permit Fail Timestamp: 16:10:20 +1457389

QPAControl / Timing Resolver: QP04-R10AQD4-yi10-q89-qp first to trip, no faults indicated.

Quench Detector(s) Trip: All tripped indicating Positive Tq Values.

Multiple auxiliary trips still not cleared from last quench event PR-068: 2b-qd2, Y1TQ6\_VT, Int. 100, 4b-qd2, Y4TQ6\_VT, Int. 100, 6b-qd2, Y6TQ6\_VT, Int. 100, 8b-qd2, Y8TQ6\_VT, Int. 100, 10a-qd2, Y9TQ6\_VT, Int. 100 and 12a-qd2, Y12TQ6\_VT, Int. 100.

5 Minute: Quench Delay File: No indications.

Beam Loss Monitors (Rads/Hr): No beam in the machine.

Main Magnet Power Status: Ramping to store; YDMC = 3817.38 amps, YQMC = 3914.87 amps.  
Yellow Main Quad also indicated a Current Monitor Alert

Technical Notes / Sequence of Events: yi10-q89-ps, AC Power, Standby, Remote, Error signal, Quench

This Yellow quench event occurred because the yi10-q89-ps Current stopped at -215 amps while Iref and Wfg's continue to ramp the supply down. When this occurred, Error took off past the 5 volt threshold for more then 4 seconds, tripping the supply on error fault. -G. Heppner [yellow] [quench]

Physics / MCR Logs: Yellow QLI during a hysteresis ramp with no beam using the Cu101 ramp file. The current reference for the yi10-q89 supply dropped to zero before the QLI.

QLI Recovery TAPE Start: 16:20:03    Link Recovered Time: 16:28:01    Estimated Down Time: 28 minutes

***Quench Analysis: yi10-q89-ps (Unknown at this time)***  
***(Counter = IR Supply)***